REMARKS/ARGUMENTS

In the amended claims, independent claims 1, 20 and 35 have been amended to distinguish the invention more clearly from the cited references.

More particularly, independent claims 1 and 20 have been amended to include the step of placing a mask in the path of laser radiation to create a patterned laser beam bearing the pattern of the desired diffractive device (claim 1) or polarisation pattern (claim 20); and claims 1 and 35 have been amended to include the step of applying a transparent coating to one side of the substrate, with the irradiating step now stating that the optically diffractive structure is formed by laser ablation of a surface of the transparent coating.

Previously presented claims 2, 5, 13 through 17, 19, 21, 23, 24, 38 to 40 and 43 through 55 have been cancelled.

AMENDED CLAIMS 1, 3, 4, 6-12, AND 18

Anticipation

The independent claim 1 and certain claims dependent thereon, were previously rejected as being fully anticipated by JP 10-113780, JP 10-310221 and JP 11-064614. However, none of those references was cited against dependent claim 5, the features of which have now been incorporated into amended claim 1. Further, it is submitted that none of these citations anticipates amended claim 1 for the reasons given below.

JP 10-113780

This document discloses a laser beam machining method for making a diffraction grating in which two or more masks are inserted into the optical path of a laser beam for ablation of a workpiece 9. Possible materials for the workpiece include high molecular compounds (e.g. polyamide), ceramics, glass or even metal. However, there is no teaching or suggestion of laser ablation of a transparent coating applied to a substrate to form an optically diffractive structure in the substrate as claimed in

amended claim 1.

Also, JP 10-113780 requires at least two masks with lines running parallel to one another which are moved relative to one another so as to make a variable width grating. In order to form a complex grating of variable depth, multiple exposures are required with the two masks being moved relative to one another for each exposure.

In contrast, amended claim 1 states that a single mask is placed in the path of laser radiation to create a patterned laser beam bearing the pattern of the desired optically diffractive device. By using a single mask which creates the patterned laser beam, it is possible to form a complex optically diffractive element in the form of a three-dimensional micro structure in the transparent coating in a single laser exposure process. This significantly reduces the time required to form the optically diffractive micro structure compared to the multiple exposure process of JP 10-113780 in which movement of the masks between each exposure wastes valuable time in the manufacturing process.

It is therefore submitted that amended claim 1 is not anticipated by JP 10-113780.

J P 10-319221

This document discloses a process for manufacturing a diffraction grating in which a reflective film is deposited on a polymeric material and irradiated by a laser beam. The laser beam removes selected portions of the reflective material and ablates the polymeric material to make the diffraction grating.

The type of diffraction grating manufactured by the method of JP 10-310221 is a linear grating, e.g. for use in optical encoders. These are used to position devices in exact locations. They are by necessity reflective devices that are read from the same side as the illuminating light source. In the prior art described in this document, the diffraction grating is formed by depositing or etching a reflective metal membrane on a substrate of glass or resin film. The invention of JP 10-310221 thus

involves creation of the diffraction grating by irradiating the reflective material deposited on the substrate with laser radiation to form the grating.

The Examiner will note that previous claims 13 through 17 which were directed to the optically diffractive structure being formed in a reflective coating have been cancelled. As there is no disclosure in JP 10-319221 of applying a transparent coating to a transparent substrate or irradiating an area of a surface of such a transparent coating with a patterned laser beam to form a three-dimensional optically diffractive structure in the transparent coating, it is respectfully submitted that amended claim 1 is clearly novel over this reference.

JP 11-06614

This reference also relates to production of a reflection type optical element, such as a diffraction grating. In the process described a reflective metallic film is applied to one side of a substrate (e.g. of glass or a high polymer film) and the substrate is irradiated with a laser beam from a direction reverse from the reflective film to ablate the surface of the substrate forming a linear reflective diffraction grating. There is no disclosure of applying a transparent coating to the substrate or irradiating a surface of a transparent coating with patterned laser radiation to form a three-dimensional optically diffractive structure as claimed in amended claim 1.

It is therefore submitted that amended claim 1 is clearly not anticipated by JP 11-064614.

Inventive Step

GB 2 222 696 in view of JP 10-319221 or JP 11-064614

The Examiner has objected to previous claims 1, 3-4, and 13, as being obvious over GB 2 222 696 in view of either JP 10-310221 or JP 11-064614.

GB 2 222 696 discloses the use of pulsed excimer laser radiation to fabricate a holographic diffraction grating using a Fresnel biprism to divide the wave front of the laser

output. A polymeric substrate is placed at the position of full overlap of the two halves of the beam so that the holographic grating is etched on the surface of the substrate.

There is, however, no disclosure of applying a transparent coating to a substrate, nor irradiating an area of a transparent coating with a patterned laser beam to form a three-dimensional optically diffractive structure in the transparent coating as claimed in amended claim 1.

As these features are also not taught by JP 10-319221 and JP 11-064614, a combination of GB 2 222 696 with either of the Japanese references would not result in the invention of amended claim 1. Therefore, that claim, and the claims dependent thereon, cannot be obvious having regard to this combination of references, a fact apparently acknowledged by the Examiner as he did not previously object on the basis of those references to previous dependent claim 5, the features of which have now been incorporated into claim 1.

JP 06-51683, Takeuchi et al (US 4,856,857) or
JP 62-111276 in view of JP 10-310221 or JP 11-064614

The Examiner rejected previous claims 1-18 as being obvious over these references.

JP 06-51683 relates to the manufacture of a partial hologram in which a printing or coating layer 3 is partially formed on the surface of a hologram layer 2. This has the effect of hiding the hologram in areas B where the printing or coating layer is applied. The printing or coating layer 3 is not, however, equivalent to the transparent coating in amended claim 1 because that claim specifies that the transparent coating is first applied to the substrate and then the three-dimensional optically diffractive structure is actually formed in the transparent coating. Thus, the transparent coating does not hide the diffractive structure, in contrast to the printing or coating layer 3 of JP 06-51683 which is applied subsequent to formation of the holographic structure.

Therefore, as the printing or coating layer of JP 06-51683 differs from the transparent coating of amended claim 1 both in its function and in the time when it is applied in the manufacturing method, it is submitted that claim 1 is not obvious having regard to a combination of the teaching of JP 06-51683 with either JP 10-319221 or JP 11-064614.

US 4,856,857 (Takeuchi et al)

This patent relates to a transparent reflection - type hologram which has a transparent hologram forming layer and a holographic effect enhancing layer which endows the hologram with the characteristics of a reflection-type hologram. The holographic enhancing layer is not, however, equivalent to the transparent coating in amended claim 1 because that claim specifies that the transparent coating is first applied to the substrate and then the three dimensional optically diffractive structure is formed in the transparent coating itself. Thus the transparent coating does not change the characteristics of the diffractive structure. In contrast, the holographic effect enhancing layer of Takeuchi is applied subsequently after the formation of the hologram to enhance the characteristics so that the holographic effects can be seen in reflection.

Therefore, the holographic enhancing layer of Takeuchi differs from the transparent coating of amended claim 1 not only in its function, but also in the time at which it is applied in the manufacturing method. Thus claim 1 cannot be considered obvious having regard to a combination of Takeuchi with either JP 10-319221 or JP 11-064614 because none of those references discloses or suggests the application of a transparent coating to a substrate and the subsequent formation of an optically diffractive structure by laser ablation in the transparent coating.

J P 62-111276

This document discloses a stamper plate for forming a hologram on an opaque dark plastic body. The surface of the hologram may be covered with a protecting layer. The protective layer is not, however, equivalent to the transparent

coating in amended claim 1 because this claim specifies that the transparent coating is first applied to the substrate and then the three dimensional optically diffractive structure is formed by laser ablation in the transparent coating itself. In contrast, the protecting layer in JP 62-111276 is applied after the hologram is formed by stamping in the opaque dark plastic body. There is no teaching or suggestion in JP 62-111276 of forming the hologram by laser ablation or even stamping in the protecting layer.

The protecting layer of JP 62-111276 also differs from the transparent coating of amended claim 1 not only in its function, but also in the time at which it is applied in the manufacturing method. It is therefore submitted that claim 1 cannot be considered obvious having regard to a combination of JP 62-111276 with either JP 10-310221 or JP 11-064614, because none of those references discloses or suggests the formation of an optically diffractive structure by laser ablation in a transparent coating previously applied to a substrate.

The claims dependent directly or indirectly on claim 1 are deemed allowable for the same reasons as claim 1, as well as for the detailed subject matter contained therein.

Merit of the Invention of Claims 1 et seq.

The Examiner has invited the applicant to submit evidence that the claimed processes yield different results or are otherwise imbued with some unobvious effect.

First, there is an advantage in the use of a single mask over the multiple mask process of JP 10-113780 in that a single mask which creates a patterned laser beam bearing the pattern of the desired optically diffractive device enables a complex three-dimensional diffractive microstructure to be formed in a single laser exposure process. The invention is particularly applicable to a type of diffractive device known as a diffractive optical element (DOE) which creates a projected image in a plane spaced away from the plane of the substrate when illuminated by a point light source.

Such DOEs, also called numerical-type DOEs, are complex microstructures and typically can include up to 40 billion cells in an area of 20mm x 20mm dimension. The

manufacture of numerical type DOEs involves a mapping of complex data that reconstructs in the far field (the reconstruction plane) an intensity pattern that can be observed only in the reconstruction plane when the DOE is illuminated by collimated light such as from a point light source. The transformation between the plane in which the DOE is located and the reconstruction plane can be approximated by a Fast Fourier Transform (FFT) algorithm. Such numerical type DOEs are different from Holographic Optical Elements (HOEs) in the sense that a hologram or HOE is designed by optimizing two interfering wave fronts rather than in the DOE case where the actual microstructures are optimized. Copies of pages 74-77 explaining the difference between HOEs and Numerical-type DOEs from a book entitled *Digital Diffractive Optics* by Bernhard Kress and Patrick Meyrueis (2000 John Wiley & Sons Ltd) accompany this response.

Before the present invention, the conventional methods of manufacturing DOEs involved either the use of scanning laser-beam or electron-beam writing machines using a computer controlled writing machine in which the laser beam and stage on which the substrate is mounted are moved relative to one another in conjunction with a computer program to write the DOE data in the substrate, and a photolithographic transfer process or an etching process using acid or computer controlled high energy collimated argon ion beams or plasma sources.

A preferred embodiment of the present invention involves placing a mask specifically designed by an inverse Fourier transform process in the path of laser radiation to create a patterned beam bearing the pattern of the desired diffractive device so that the laser beam ablates the pattern of the DOE directly in a transparent coating applied to the substrate to form the DOE in a single exposure or "one-shot" process. This has advantages when forming DOEs in security documents, such as banknotes or the like, in that the same patterned DOE mask can be used to manufacture DOEs in a sheet containing a large number of banknotes simply by firing a single laser pulse through the DOE mask to form a DOE in one banknote, moving the sheet and repeating the process for each banknote in the sheet. This process can be performed more rapidly and economically than using a scanning laser

beam, a lithographic transfer process or an etching process to create DOEs in each banknote in a sheet.

Another advantage of the present invention, particularly over JP 10-319221 is that in JP 10-319221 large energy is required for laser removal of a metallic material, as acknowledged in paragraph [0009] leading to problems in control of the processing depth for each laser exposure. Thus, either multiple exposures are required, or in the case of Figures 1 and 4 where a mask 4 is used, a projection lens 5 is required to focus the intensity distribution on the workpiece 6 with the reflective film. If a continuous linear grating pattern is required the workpiece is moved on the migration stage 7 relative to the laser beam as described with reference to Figures 3 and 5.

In contrast, in the present invention the ablation of a transparent coating applied to a substrate requires less energy than for a reflective metallic coating and enables a complex three dimensional optically diffractive structure to be formed in the transparent coating by laser ablation in a single exposure to a patterned laser beam produced from a single mask without requiring a projection lens to focus the laser beam onto the workpiece as in JP 10-310221.

It is therefore submitted that the invention claimed in amended claim 1 is not only novel, but also involves an inventive step over JP 10-319221.

A further advantage of the present invention as claimed in claim 1 over JP 10-319221 and JP 11-064614 is that irradiating an area of the surface of a transparent coating applied to a transparent substrate enables transmissive optically diffractive devices to be formed, in contrast to the reflection type optical elements of the Japanese references which have reflecting films applied to the base substrate. There is nothing in those Japanese references which would lead a person skilled in the art to consider producing a transmissive optically diffractive device by irradiating a transparent coating applied to a transparent substrate instead of the reflection type diffraction gratings of the Japanese references.

Having regard to the observations above, it is submitted that the invention as claimed in amended claim 1 has inventive merit over the disclosures of all the cited

references and that that claim and also the claims dependent thereon are patentable in all respects.

CLAIMS 20, 22, 25-35

US 5,384,221 (Savant) in view of US 5,340,637 (Okai)

and US 5,389,698 (Chigrinov).

The Examiner rejected previously submitted claims 19, 20, 22, 25 to 28 and 31 as being unpatentable over this combination of references. Independent claim 19 has been cancelled, and independent claim 20 has been amended to include the step of "placing a mask in the path of laser radiation to create a single patterned laser beam bearing the pattern of the desired polarisation pattern".

Savant (US 5,384,221) relates to an optical storage medium including azo dyes dispersed in polymers for use in holographic recording. An inherent feature of holographic recording is that a multiple beam exposure process is required to produce interfering beams at the surface of the recording medium. This holographic process is quite different from the invention as claimed in amended claim 20 which uses a single patterned laser beam created by placing a mask in the path of laser radiation to form a polarization pattern.

Okai (US 5,340,637) also teaches the use of two beam exposure processes for manufacturing diffraction gratings. Although this process uses a photo mask, the mask creates a transmission wave 31 and a diffraction wave 33 which interfere with each other to create bright/dark fringes at the photo-resist film on the substrate. Again, this two beam exposure process for forming a diffraction grating is quite different from claim 20 which uses a single patterned laser beam created by a mask to form a polarization pattern on a surface on one side of the substrate.

Chigrinov (US 5,389,698) discloses a process for making photopolymers having varying molecular orientation. The process uses either an interferometric, i.e. two-beam, process using linearly polarized light (from a UV laser or plane polarized UV light)

from a non-polarized UV light source through a polarizer which is focused through a lens, optionally with a mask in front.

Thus, Chigrinov is the only reference which relates to producing a polarization pattern, as opposed to Savant and Okai which relate to processes for making holograms and diffraction gratings. Chigrinov does not teach or suggest using a single patterned laser beam created by placing a mask in the path of laser radiation. As both Savant and Okai only disclose two-beam interferometric processes, a combination of either of those references with Chigrinov would not result in amended claim 20.

Further, it would not have been obvious to a person of ordinary skill in the art looking to improve the method of Chigrinov for forming a security document or device having a polarization pattern to consult Savant or Okai as both those references relate to two-beam processes for creating diffractive devices. Moreover, there is nothing in Savant or Okai that would lead the skilled person to use a single patterned laser beam created by a mask in the process of Chigrinov, because Savant and Okai teach away from amended claim 20 by disclosing two-beam interferometric processes.

Grime in view of Okai and Chigrinov

The Examiner rejected previously submitted claims 19, 20 and 22 as being unpatentable over Grime, G.W., *"Holographic Diffraction Gratings recorded in Photoresist"* in view of Okai '637 and Chigrinov '698.

Grime, like Savant and Okai, is concerned with the formation of holographic diffraction gratings, a process which necessarily involves two-beam interferometric techniques. Thus, a combination of the teaching of Grime with Okai and/or Chigrinov simply would not result in amended claim 20 which recites the use of a single patterned laser beam bearing the pattern of the desired polarization pattern created by placing a mask in the path of laser radiation.

Furthermore, there is nothing in the teaching of Grime that would lead a person skilled in the art to modify the process of Chigrinov in the manner claimed in

amended claim 20. In fact, as Grime relates to a two-beam interferometric technique for forming a hologram, Grime teaches away from the single beam technique of claim 20.

JP 06-51683, Takeuchi '857 or JP 62-111276
in view of Grime combined with Okai `637 and Chigrinov '698

As discussed above, each of JP 06-51683, Takeuchi and JP 62-111276 relate to the manufacture of holograms. These three references are concerned with applying additional layers over the hologram, such as printing layers, hologram enhancing layers or a protective layer after the hologram has been formed on a substrate. None of these references relates to the manufacture of a security document or device having a polarization pattern, let alone teach or suggest that a single patterned laser beam created by placing a mask in the path of laser radiation can be used for this purpose. Thus, it is submitted that claims 20 et seq. cannot be found to be obvious having regard to any of these references in view of Grime combined with Okai and Chigrinov. Moreover, it is respectfully submitted that a mosaic of such a large number of documents cited in an obviousness object surely supports the presence of an inventive step as opposed to the lack of one.

AMENDED CLAIMS 35-37, 41 AND 42

Claim 35 relates to a method of producing a security document or device comprising a transparent plastics substrate and a transmissive optically diffractive device. Claim 35 has also been amended to include the step of applying a transparent coating to one side of the transparent plastics substrate and the claim recites that the transmissive optically diffractive structure is formed in said transparent coating.

Anticipation

It is submitted that amended claim 35 is not anticipated by JP 10-113780, JP 10-10221 or JP 11-064614 for the reasons given below.

JP 10-113780

This document discloses a laser beam machining method for making a diffraction grating in which two or more masks are inserted into the optical path of a laser beam for ablation of a workpiece 9. Possible materials for the workpiece include high molecular compounds (e.g. polyamide), ceramics, glass or even metal. However, there is no teaching or suggestion of laser ablation of a transparent coating applied to a substrate to form a transmissive optically diffractive structure in the substrate as claimed in amended claim 35.

JP 10-319221

This document discloses a process for manufacturing a diffraction grating in which a reflective film is deposited on a polymeric material and irradiated by a laser beam. The laser beam removes selected portions of the reflective material and ablates the polymeric material to make the diffraction grating.

The type of diffraction grating manufactured by the method of JP 10-310221 is a linear grating, e.g. for use in optical encoders. These are used to position devices in exact locations. They are by necessity reflective devices that are read from the same side as the illuminating light source. In the prior art described in this document, the diffraction grating is formed by depositing or etching a reflective metal membrane on a substrate of glass or resin film. The invention of JP 10-310221 thus involves creation of the diffraction grating by irradiating the reflective material deposited on the substrate with laser radiation to form the grating.

The Examiner will note that previous claims 43 through 50 which were directed to the optically diffractive structure being formed in a reflective coating have been cancelled. As there is no disclosure in JP 10-319221 of applying a transparent coating to a transparent substrate or irradiating an area of a surface of such a transparent coating with a patterned laser beam to form a three-dimensional optically diffractive structure in the

transparent coating, it is respectfully submitted that amended claim 35 is clearly novel over this reference.

Further, amended claim 35 which is clearly directed to a method of producing a security document or device comprising a transparent plastics substrate and a transmissive optically diffractive device, is not anticipated by JP 10-319221.

JP 11-06614

This reference also relates to production of a reflection type optical element, such as a diffraction grating. In the process described a reflective metallic film is applied to one side of a substrate (e.g. of glass or a high polymer film) and the substrate is irradiated with a laser beam from a direction reverse from the reflective film to ablate the surface of the substrate forming a linear reflective diffraction grating. There is no disclosure of applying a transparent coating to the substrate or irradiating a surface of a transparent coating with patterned laser radiation to form an optically diffractive structure nor any disclosure or suggestion of manufacturing a transmissive optically diffractive structure as claimed in amended claim 35.

It is therefore submitted that amended claim 35 is clearly not anticipated by JP 11-064614.

Inventive Step

GB 2 222 696 in view of JP 10-319221 or JP 11-064614

The Examiner has rejected to previous claims 35-38 and 43-45 as being obvious over GB 2 222 696 in view of either JP 10-310221 or JP 11-064614.

GB 2 222 696 discloses the use of pulsed excimer laser radiation to fabricate a holographic diffraction grating using a Fresnel biprism to divide the wave front of the laser output. A polymeric substrate is placed at the position of full overlap of the two halves of the beam so that the holographic grating is etched on the surface of the substrate.

There is, however, no disclosure of applying a transparent coating to a

substrate, nor irradiating an area of a transparent coating with a patterned laser beam to form a transmissive optically diffractive structure in the transparent coating as claimed in amended claim 35. As these features are also not taught by JP 10-319221 and JP 11-064614, a combination of GB 2 222 696 with either of the Japanese references would not result in the invention of amended claim 35. Therefore, that claim cannot be obvious having regard to this combination of references, a fact apparently acknowledged by the Examiner as he did not previously object on the basis of those references to previous dependent claim 40, the features of which have now been incorporated into claim 35.

JP 06-51683, Takeuchi et al (US 4,856,857) or
JP 62-111276 in view of JP 10-310221 or JP 11-064614

The Examiner rejected previous claims 35-50 as being obvious over these references.

JP 06-51683 relates to the manufacture of a partial hologram in which a printing or coating layer 3 is partially formed on the surface of a hologram layer 2. This has the effect of hiding the hologram in areas B where the printing or coating layer is applied. The printing or coating layer 3 is not, however, equivalent to the transparent coating in amended claim 35 because that claim specifies that the transparent coating is first applied to the substrate and then the transmissive optically diffractive structure is actually formed in the transparent coating. Thus, the transparent coating does not hide the diffractive structure, in contrast to the printing or coating layer 3 of JP 06-51683 which is applied subsequent to formation of the holographic structure.

Therefore, as the printing or coating layer of JP 06-51683 differs from the transparent coating of amended claim 35 both in its function and in the time when it is applied in the manufacturing method, it is submitted that claim 35 is not obvious having regard to a combination of the teaching of JP 06-51683 with either JP 10-319221 or JP 11-064614.

US 4,856,857 (Takeuchi et al)

This patent relates to a transparent reflection - type hologram which has a transparent hologram forming layer and a holographic effect enhancing layer which endows the hologram with the characteristics of a reflection-type hologram. The holographic enhancing layer is not, however, equivalent to the transparent coating in amended claim 35 because that claim specifies that the transparent coating is first applied to the substrate and then the transmissive optically diffractive structure is formed in the transparent coating itself. Thus the transparent coating does not change the characteristics of the diffractive structure. In contrast, the holographic effect enhancing layer of Takeuchi is applied subsequently after the formation of the hologram to enhance the characteristics so that the holographic effects can be seen in reflection.

Therefore, the holographic enhancing layer of Takeuchi differs from the transparent coating of amended claim 35 not only in its function, but also in the time at which it is applied in the manufacturing method. Thus claim 35 cannot be considered obvious having regard to a combination of Takeuchi with either JP 10-319221 or JP 11-064614 because none of those references discloses or suggests the application of a transparent coating to a substrate and the subsequent formation of an optically diffractive structure by laser ablation in the transparent coating.

JP 62-111276

This document discloses a stamper plate for forming a hologram on an opaque dark plastic body. The surface of the hologram may be covered with a protecting layer. The protective layer is not, however, equivalent to the transparent coating in amended claim 35 because this claim specifies that the transparent coating is first applied to the substrate and then the three dimensional optically diffractive structure is formed by laser ablation in the transparent coating itself.

In contrast, the protecting layer in JP 62-111276 is applied after the

hologram is formed by stamping in the opaque dark plastic body. There is no teaching or suggestion in JP 62111276 of forming the hologram by laser ablation or even stamping in the protecting layer.

The protecting layer of JP 62-111276 also differs from the transparent coating of amended claim 35 not only in its function, but also in the time at which it is applied in the manufacturing method. It is therefore submitted that claim 35 cannot be considered obvious having regard to a combination of JP 62-111276 with either JP 10-310221 or JP 11-064614, because none of those references disclose or suggest the formation of a transmissive optically diffractive structure by laser ablation in a transparent coating previously applied to a substrate.

Further, it is submitted that a person of ordinary skill in the art would not consider the invention of claim 35 to be obvious having regard to these three Japanese references because none of them teaches or suggests the formation of a transmissive optically diffractive device.

As discussed above, JP 10-319221 and JP 11-064614 both relate to the manufacture of reflection-type diffraction gratings which have reflective layers, and in JP 62-111276 the hologram is formed on an opaque dark plastics body, and so the hologram can only be viewed in reflection, and not in transmission. Thus, the invention of claim 35 is not taught or suggested in JP 62-111276, JP 10-310221 and JP 11-064614 since they all lead away from the present invention in that they only teach the manufacture of reflection-type diffraction gratings or holograms, and so claim 35 would not have been obvious to a skilled person in the art in view of that combination of references.

Merit of the Invention of Claims 35 et seq.

The Examiner has invited the applicant to submit evidence that the claimed processes yield different results or are otherwise imbued with some unobvious effect.

A particular advantage of the present invention as claim 35 over JP 10-319221 and JP 11-064614 is that irradiating an area of the surface of a transparent coating applied to a transparent substrate enables transmissive optically diffractive devices to be formed, in contrast to the reflection type optical elements of the Japanese references which have reflecting films applied to the base substrate. There is nothing in those Japanese references which would lead a person skilled in the art to consider producing a transmissive optically diffractive device by irradiating a transparent coating applied to a transparent substrate instead of the reflection type diffraction gratings of the Japanese references.

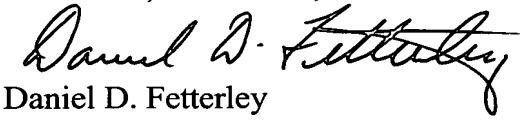
Having regard to the observations above, it is submitted that the invention as claimed in amended claim 35 has inventive merit over the disclosures of all the cited references and that that claim, and also the claims dependent thereon, are patentable in all respects.

CONCLUSION

In view of the observations above and the amendments made to the claims, it is submitted that all of the claims as amended are patentable and favorable reconsideration of this application is courteously requested.

Respectfully submitted,

ANDRUS, SCEALES, STARKE & SAWALL, LLP



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